UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

TECHNOLOGY LICENSING CORPORATION, Plaintiff, v. RATIONAL COOKING SYSTEMS, INC., Defendant.	***Filed Under Seal*** Civil Action No. 06-515-JJF **PUBLIC VERSION**

**DECLARATION OF PORTER F. FLEMING, ESQ.
IN SUPPORT OF DEFENDANT RATIONAL COOKING SYSTEMS, INC.'S
ANSWERING BRIEF IN OPPOSITION TO TECHNOLOGY LICENSING
CORPORATION'S MOTION FOR AN EXPEDITED SCHEDULE**

I, Porter F. Fleming, declare pursuant to 28 U.S.C. § 1746 that:

1. I am a partner with the law firm of Frommer Lawrence & Haug LLP located at 745 Fifth Avenue, New York, New York 10151. I represent Rational Cooking Systems, Inc. ("RCSI") and make the following declaration in support of RCSI's Answering Brief in Opposition to Technology Licensing Corporation's motion for an expedited schedule (D.I. 10).

2. Exhibit 1 is a true and correct copy of U.S. Patent No. 4,920,948.

3. Exhibit 2 **REDACTED**

4. Exhibit 3 **REDACTED**

5. Exhibit 4 **REDACTED**

6. Exhibit 5 **REDACTED**

7. Exhibit 6 is a true and correct copy of photographs from the May 2004 National Restaurant Association Hotel-Motel Show in Chicago, Illinois.

8. Exhibit 7 is a true and correct copy of an article entitled, <u>Where Possibilities and Solutions Meet</u> (July 2004).

9. Exhibit 8 is a true and correct copy of a FAST August 22, 2006 press release available on FAST's website and downloaded today, September 20, 2006.

I declare under penalty of perjury that the foregoing is true and correct.

Dated: September 20, 2006

Porter F. Fleming

UNITED STATES DISTRICT COURT
DISTRICT OF DELAWARE

CERTIFICATE OF SERVICE

I hereby certify that on September 22, 2006, I electronically filed the foregoing with the Clerk of Court using CM/ECF which will send notification of such filing(s) to the following and which has also been served as noted:

HAND DELIVERY

Jack B. Blumenfeld
Karen Jacobs Louden
Morris, Nichols, Arsht & Tunnell LLP
1201 N. Market Street
P. O. Box 1347
Wilmington, DE 19801

I hereby certify that on September 22, 2006, the foregoing document was sent to the following non-registered participants in the manner indicated:

FEDERAL EXPRESS

Rory J. Radding
Colette A. Reiner
Morrison & Foerster LLP
1290 Avenue of the Americas
New York, NY 10101-0050

FIRST CLASS MAIL
Mario G. Ceste
The Law Offices of Mario G. Ceste, LLC
P. O. Box 82
Wallingford, CT 06492

Gregory E. Stuhlman (#4765)
stuhlman@rlf.com

UNITED STATES DISTRICT COURT
DISTRICT OF DELAWARE

CERTIFICATE OF SERVICE

I hereby certify that on September 29, 2006, I electronically filed the foregoing with the Clerk of Court using CM/ECF which will send notification of such filing(s) to the following and which has also been served as noted:

HAND DELIVERY

Jack B. Blumenfeld
Karen Jacobs Louden
Morris, Nichols, Arsht & Tunnell LLP
1201 N. Market Street
P. O. Box 1347
Wilmington, DE 19801

I hereby certify that on September 29, 2006, the foregoing document was sent to the following non-registered participants in the manner indicated:

FEDERAL EXPRESS

Rory J. Radding
Colette A. Reiner
Morrison & Foerster LLP
1290 Avenue of the Americas
New York, NY 10101-0050

FIRST CLASS MAIL
Mario G. Ceste
The Law Offices of Mario G. Ceste, LLC
P. O. Box 82
Wallingford, CT 06492

Matthew W. King(#4566)
king@rlf.com

EXHIBIT 1

United States Patent [19]
Koether et al.

[11] **Patent Number: 4,920,948**
[45] **Date of Patent: May 1, 1990**

[54] PARAMETER CONTROL SYSTEM FOR AN OVEN

[75] Inventors: Bernard G. Koether, Westport; Mario Pasquini, Milford, both of Conn.

[73] Assignee: Micro-Technology Licensing Corporation, Tequesta, Fla.

[21] Appl. No.: 114,563

[22] Filed: Oct. 29, 1987

[51] Int. Cl.[5] A21B 1/40
[52] U.S. Cl. .... 126/21 A; 99/330; 99/333; 99/468; 219/10.55 B
[58] Field of Search .... 99/328, 330, 333, 342, 99/468; 219/10.55 B, 506, 492; 126/21 A

[56] References Cited

U.S. PATENT DOCUMENTS

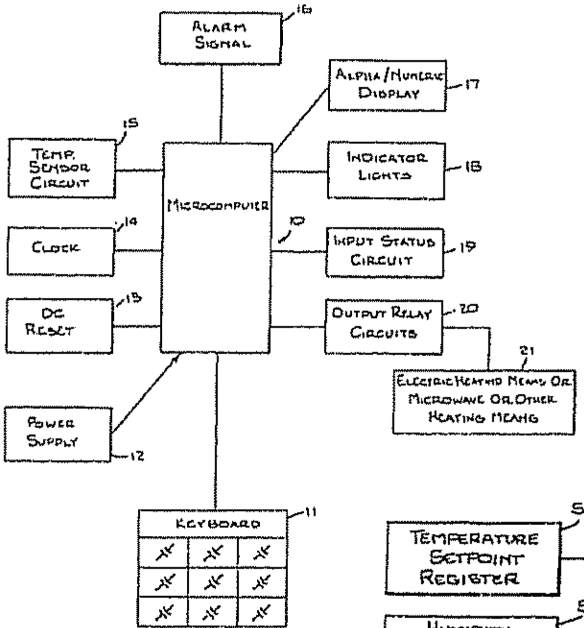
3,518,949	7/1970	Stock	99/333 X
3,734,740	5/1973	Zenos	99/1
4,309,584	1/1982	Terakami	219/10.55 B
4,337,384	6/1982	Tanaka et al.	219/10.55 B
4,366,357	12/1982	Swatoh	219/10.55 B
4,467,777	8/1984	Weber	126/21 A
4,601,004	7/1986	Holt et al	364/557
4,613,739	9/1986	Richards	219/10.55 B
4,625,086	11/1986	Karino	219/10.55 B

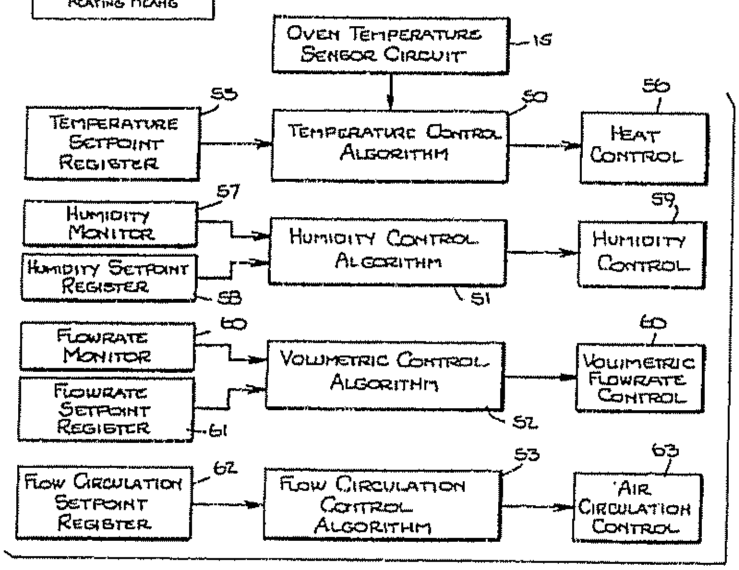
Primary Examiner—Martin P. Schwadron
Assistant Examiner—Allen J. Flanigan
Attorney, Agent, or Firm—Felfe & Lynch

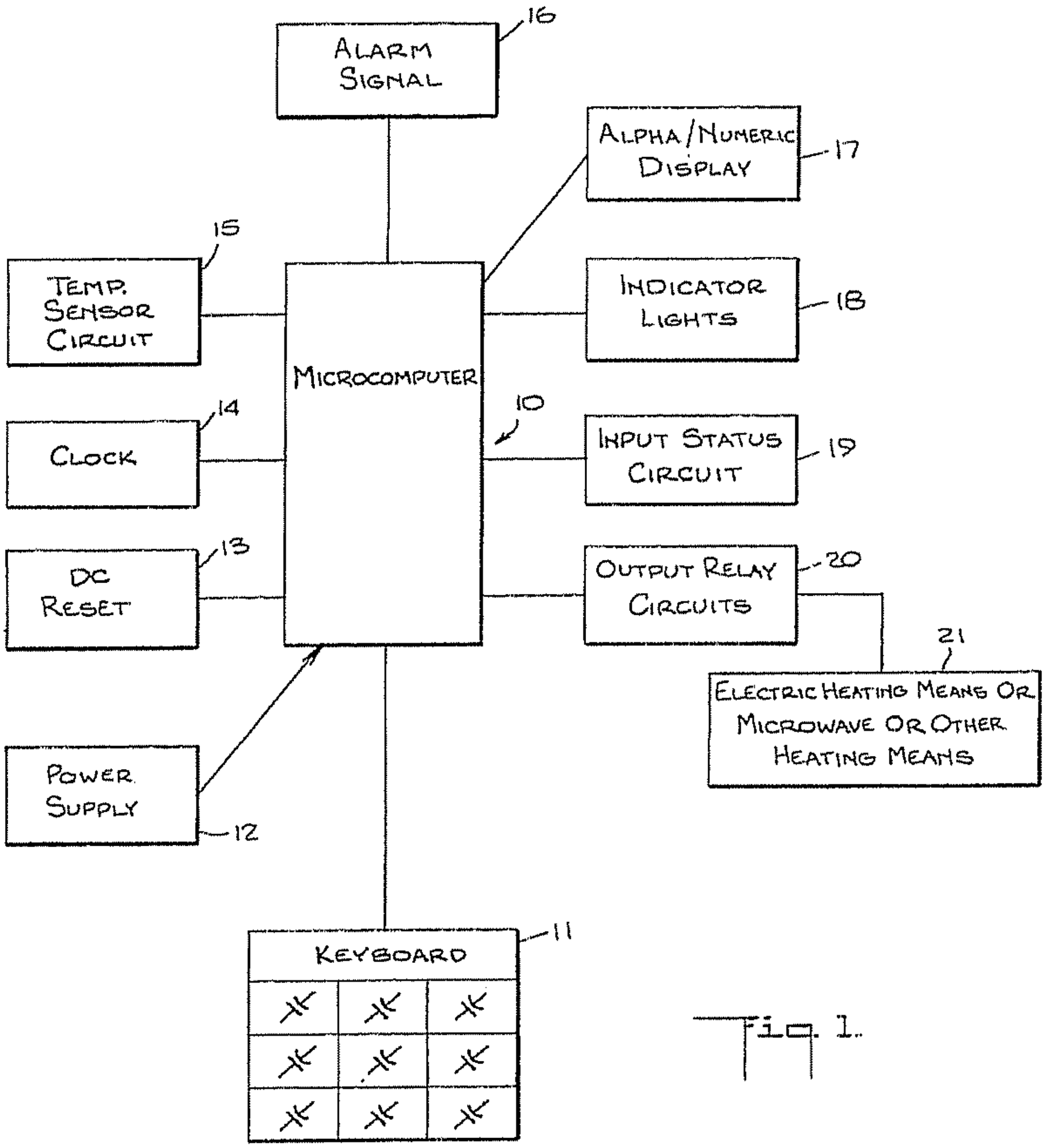
[57] ABSTRACT

A parameter control system for an oven which may, for example, be a baking oven or a convection oven having the capability of injecting steam into the cooking cavity. The parameter control system precisely controls cooking temperature, cooking time, humidity and air flow in the oven. The parameters can be easily and repeatably set.

13 Claims, 8 Drawing Sheets

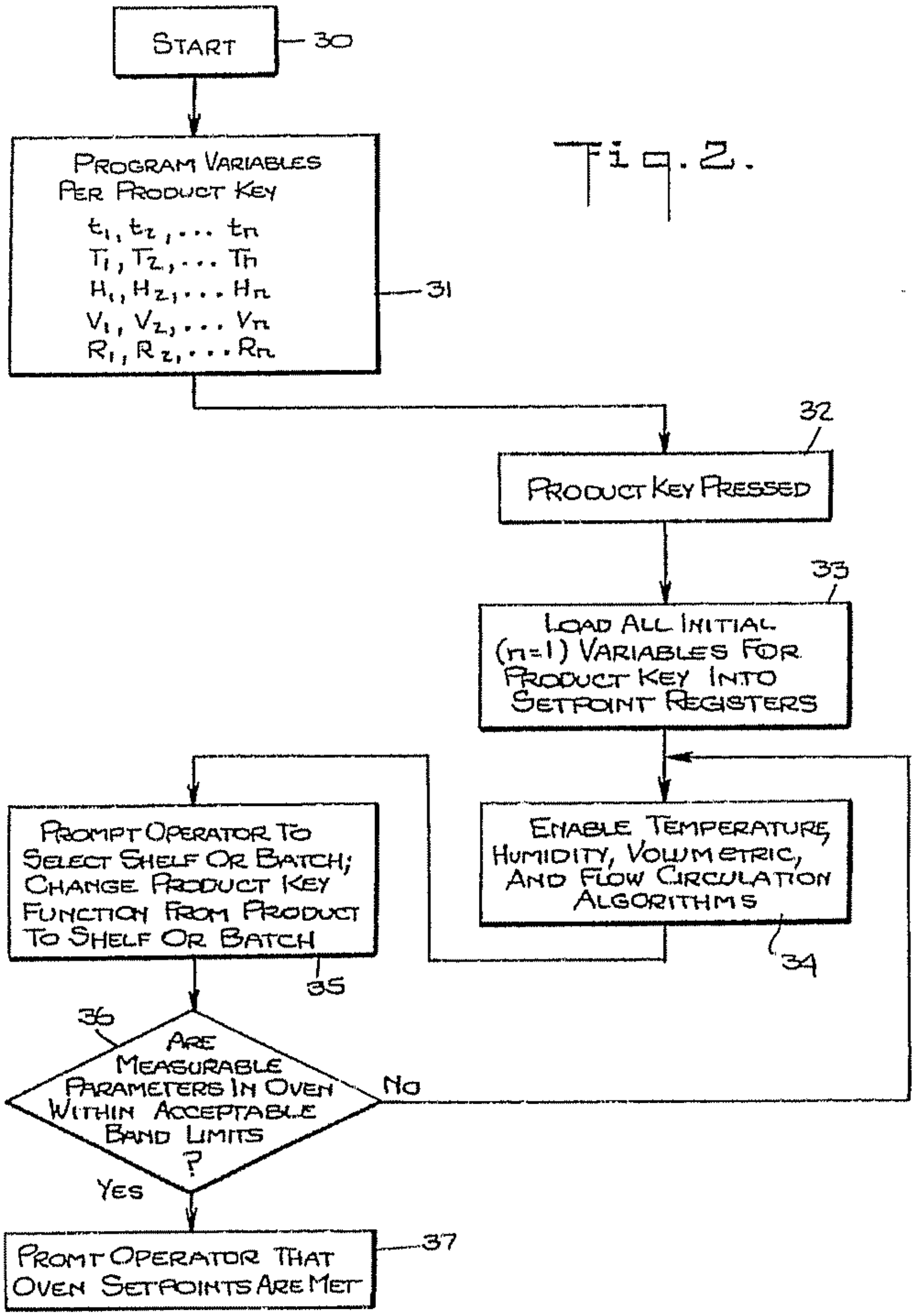






Alarm Signal
16
Alpha/Numeric Display
17
Temp. Sensor Circuit
15
Microcomputer
Indicator Lights
18
10
Clock
14
Input Status Circuit
19
DC Reset
13
Output Relay Circuits
20
21
Electric Heating Means Or Microwave Or Other Heating Means
Power Supply
12
Keyboard
11

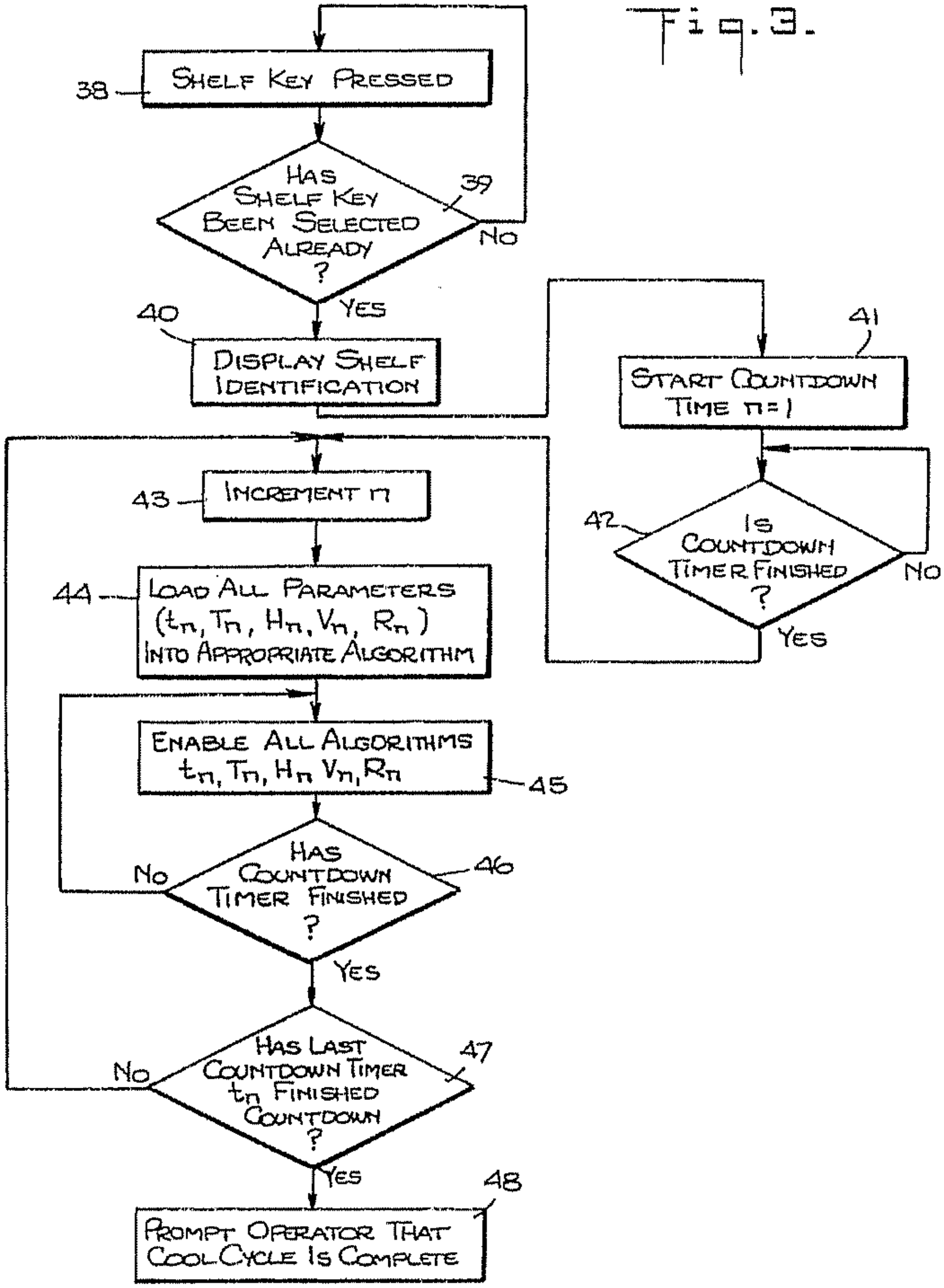
Fig. 1.



START
30
PROGRAM VARIABLES PER PRODUCT KEY
$t_1, t_2, \ldots t_n$
$T_1, T_2, \ldots T_n$
$H_1, H_2, \ldots H_n$
$V_1, V_2, \ldots V_n$
$R_1, R_2, \ldots R_n$
31
32
PRODUCT KEY PRESSED
33
LOAD ALL INITIAL (n=1) VARIABLES FOR PRODUCT KEY INTO SETPOINT REGISTERS
ENABLE TEMPERATURE, HUMIDITY, VOLUMETRIC, AND FLOW CIRCULATION ALGORITHMS
34
PROMPT OPERATOR TO SELECT SHELF OR BATCH; CHANGE PRODUCT KEY FUNCTION FROM PRODUCT TO SHELF OR BATCH
35
36
ARE MEASURABLE PARAMETERS IN OVEN WITHIN ACCEPTABLE BAND LIMITS ?
NO
YES
PROMT OPERATOR THAT OVEN SETPOINTS ARE MET
37

Fig. 2.

Fig. 3.



38
SHELF KEY PRESSED
39
HAS SHELF KEY BEEN SELECTED ALREADY ?
NO
YES
40
DISPLAY SHELF IDENTIFICATION
41
START COUNTDOWN TIME n=1
42
IS COUNTDOWN TIMER FINISHED ?
NO
YES
43
INCREMENT n
44
LOAD ALL PARAMETERS (t_n, T_n, H_n, V_n, R_n) INTO APPROPRIATE ALGORITHM
ENABLE ALL ALGORITHMS t_n, T_n, H_n V_n, R_n
45
46
HAS COUNTDOWN TIMER FINISHED ?
NO
YES
47
HAS LAST COUNTDOWN TIMER t_n FINISHED COUNTDOWN ?
NO
YES
48
PROMPT OPERATOR THAT COOL CYCLE IS COMPLETE

Fig.4.

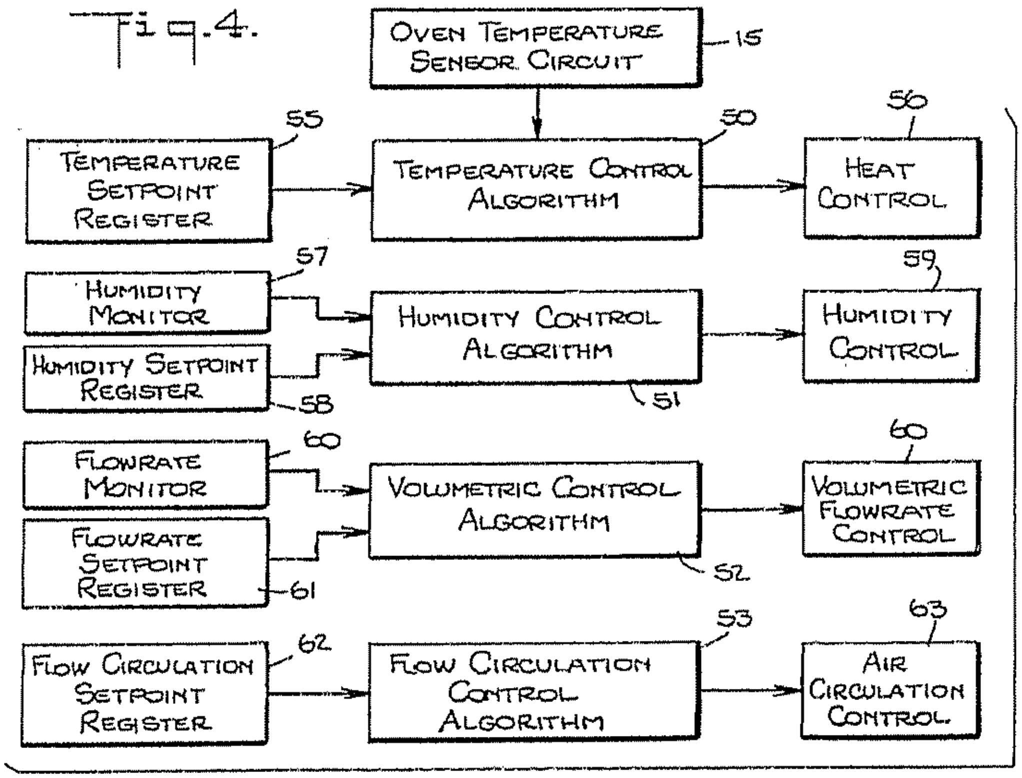

Oven Temperature Sensor Circuit
15
55
Temperature Setpoint Register
50
Temperature Control Algorithm
56
Heat Control
57
Humidity Monitor
Humidity Setpoint Register
58
Humidity Control Algorithm
51
59
Humidity Control
60
Flowrate Monitor
Flowrate Setpoint Register
61
Volumetric Control Algorithm
52
60
Volumetric Flowrate Control
62
Flow Circulation Setpoint Register
53
Flow Circulation Control Algorithm
63
Air Circulation Control

Fig.5.

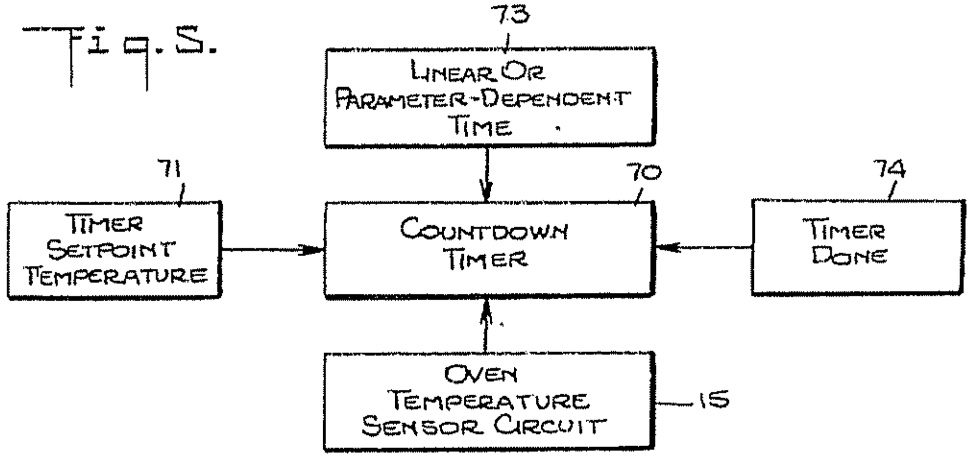

73
Linear Or Parameter-Dependent Time
71
Timer Setpoint Temperature
70
Countdown Timer
74
Timer Done
Oven Temperature Sensor Circuit
15

Fig. 6.

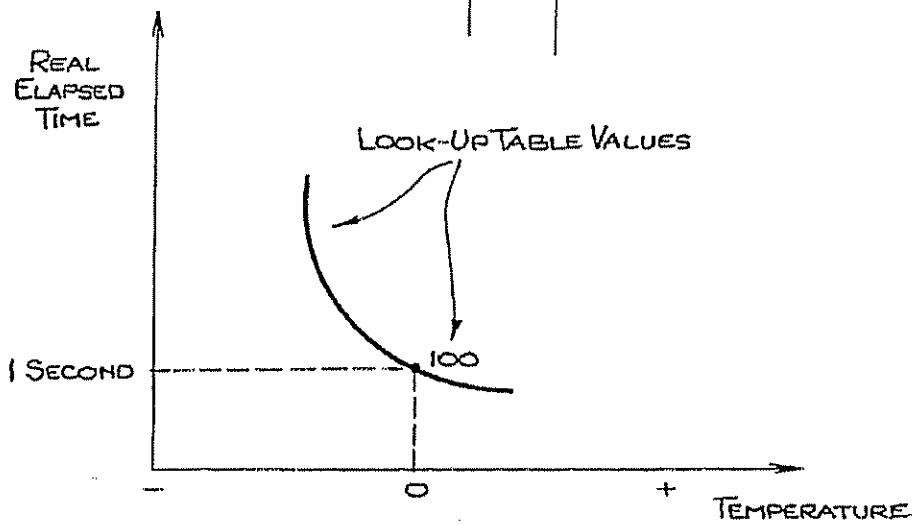
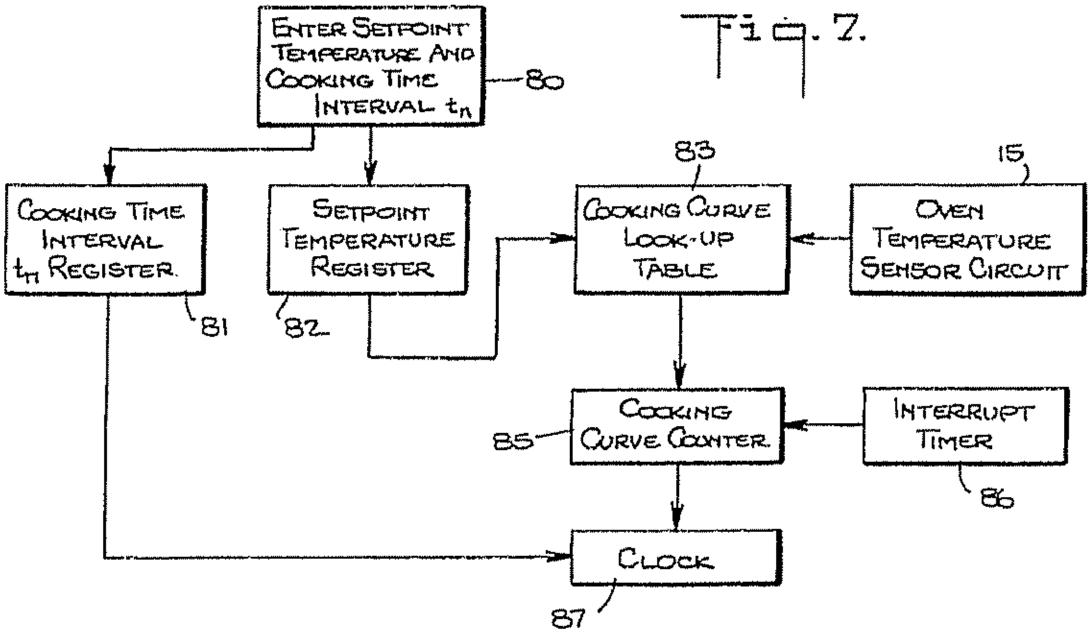

REAL ELAPSED TIME
LOOK-UP TABLE VALUES
100
1 SECOND
−
0
+
TEMPERATURE

Fig. 7.


ENTER SETPOINT TEMPERATURE AND COOKING TIME INTERVAL t_n
80
COOKING TIME INTERVAL t_n REGISTER
81
SETPOINT TEMPERATURE REGISTER
82
83
COOKING CURVE LOOK-UP TABLE
15
OVEN TEMPERATURE SENSOR CIRCUIT
COOKING CURVE COUNTER
85
INTERRUPT TIMER
86
CLOCK
87

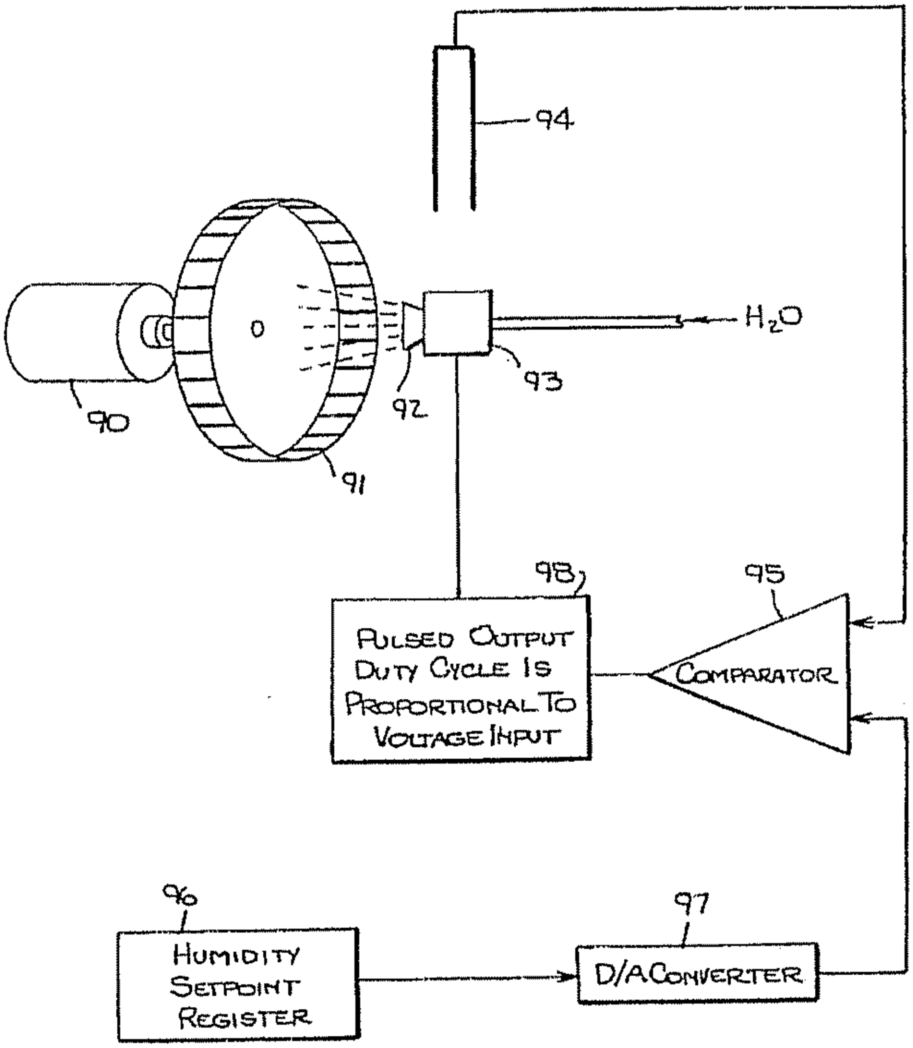
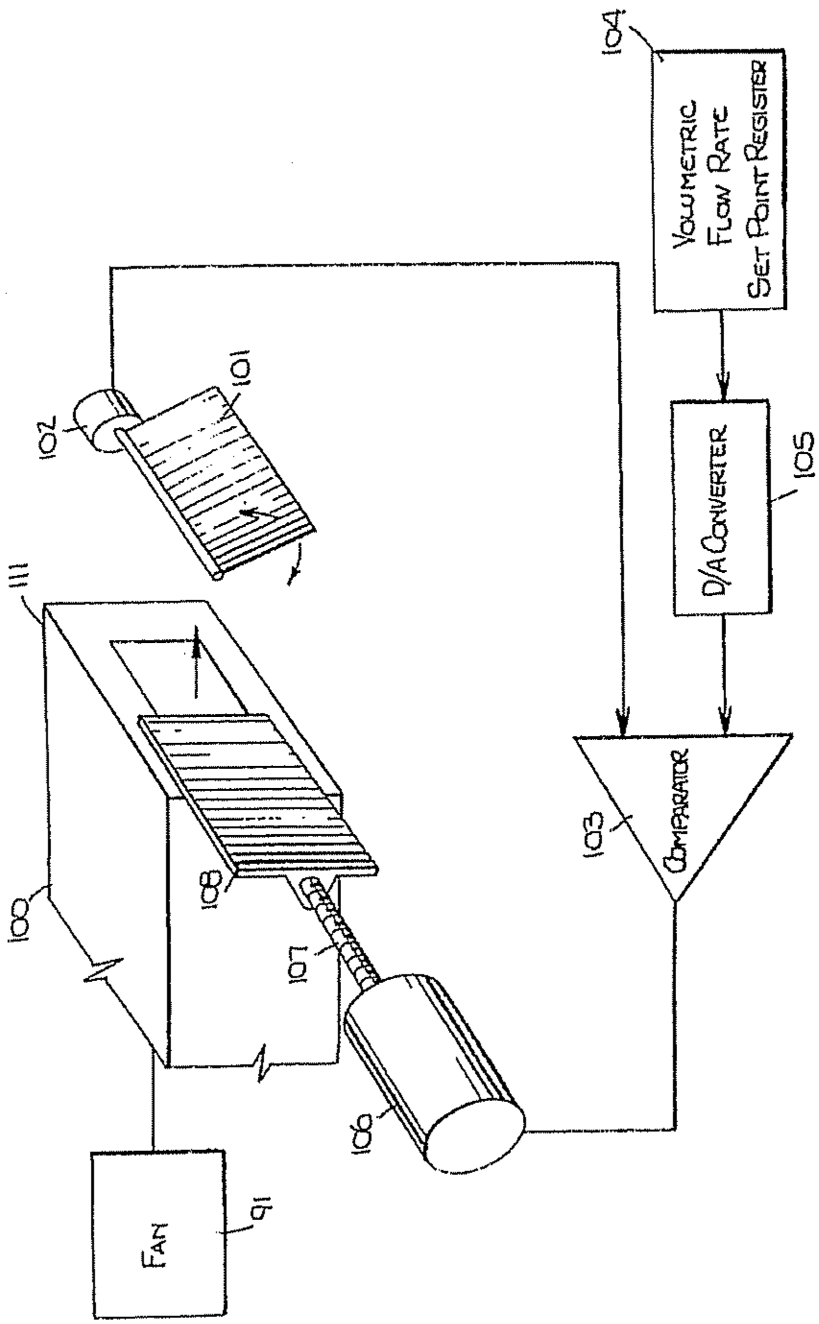

94
H_2O
93
92
90
91
98
95
Pulsed Output Duty Cycle Is Proportional To Voltage Input
Comparator
96
Humidity Setpoint Register
97
D/A Converter

Fig. 6.



104
Volumetric Flow Rate Set Point Register
105
D/A Converter
103
Comparator
101
102
111
100
108
107
106
Fan
91

Fig. 9.

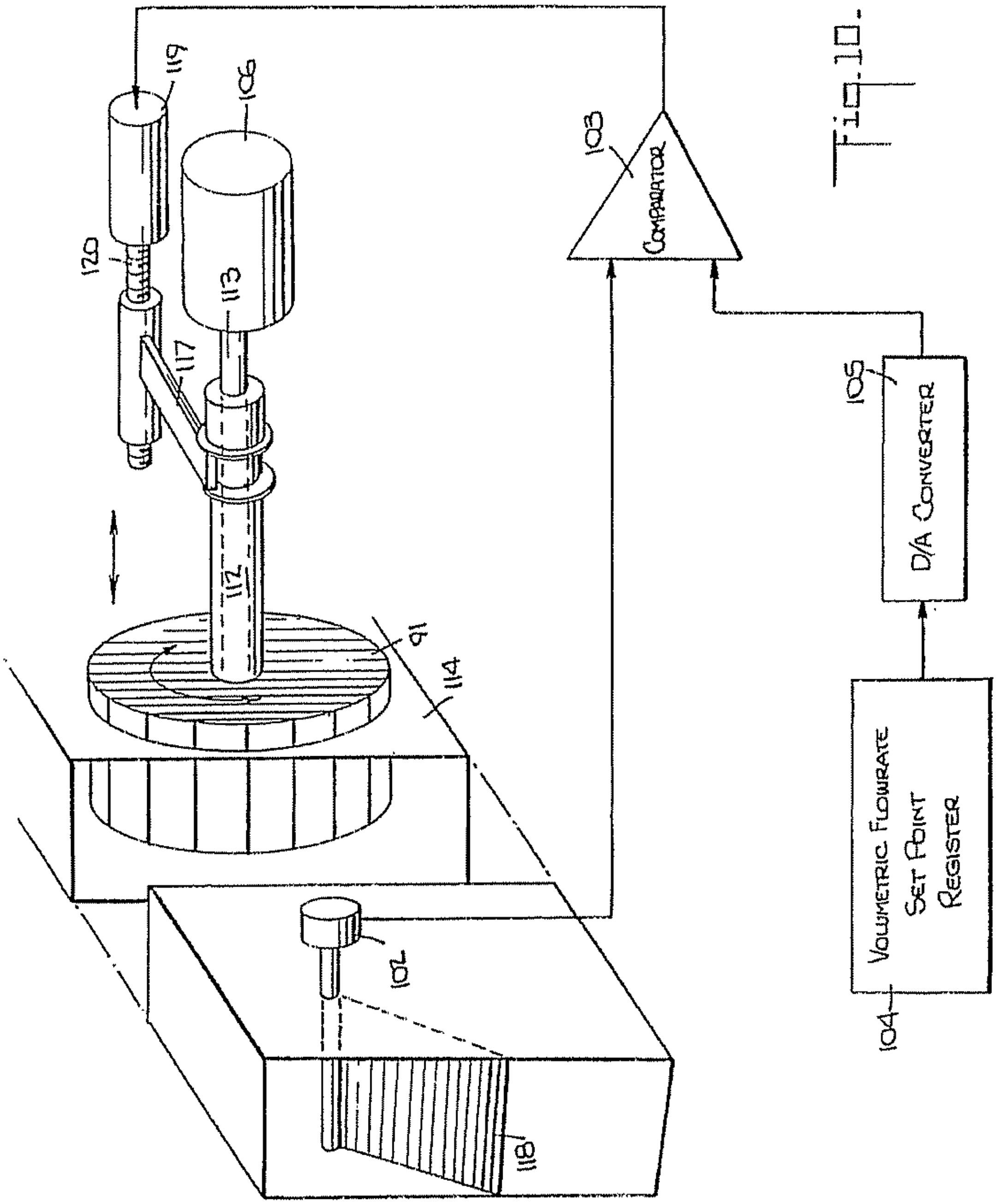

119
106
120
113
117
112
91
114
103
COMPARATOR
105
D/A CONVERTER
VOLUMETRIC FLOWRATE
SET POINT
REGISTER
104
102
118

Fig. 10.

PARAMETER CONTROL SYSTEM FOR AN OVEN

This invention relates to a parameter control system for an oven, for example, a baking oven or, for example, a convection oven that also has the capability of injecting steam into the cooking cavity. Such convection ovens with steam-injection capability are known as combi-ovens. Baking ovens or combi-ovens can be useful in a commercial kitchen for baking, steaming, proofing (or leavening), roasting, or holding products at a serving temperature. All combinations of heat and steam are typically controlled by manual controls on the combi-oven. Baking ovens or combi-ovens may, for example, be deck ovens, tunnel ovens, ferris-wheel ovens, carousel ovens or spiral ovens.

However, controls on these combi-ovens do not lend themselves to a "fast food" or chain store use where precise control of cooking temperature, cooking time, humidity, and air flow must be easily set. Also the product quality must be repeatable for each store in the store chain.

U.S. Pat. No. 4,506,598-Meister relates to a combi-oven which has a hot air mode and also has a steam mode. A single fan circulates air during both modes. During the hot air mode a vent is open for the discharge of vapor from the oven. During the steam mode, the vent is closed and when the steam displaces air out of the cooking chamber, the steam emerges out of the cooking space through a connection conduit. A control is actuated in accordance with a program during the hot air mode to control the position of a discharge pipe and a juice outflow pipe.

It is an object of the present invention, therefore, to provide a new and improved parameter control system for an oven for heating a food product.

It is another object of the invention to provide a new and improved parameter control system for a combi-oven for precisely controlling cooking temperature, cooking time, humidity and air flow in the oven.

It is another object of the invention to provide a new and improved parameter control system for an oven in which the parameters can be easily and repeatably set.

In accordance with the invention, a parameter control system for an oven for heating a food product comprises means for heating a heating medium in the oven and programmed means for controlling as a first parameter the temperature of the heating medium. The control system also includes programmed means for controlling as a second parameter the volumetric flow rate of the heating medium and programmed means for controlling one or more time intervals for predetermined values of the temperature and volumetric flow rate of the heating medium in the oven.

Also in accordance with the invention a heating system for an oven comprises a plurality of product selection keys which upon one actuation of a first key selects at least one heating parameter for a given product and which upon another actuation of the first key indicates an oven location for the given product.

Also in accordance with the invention, a parameter control system for an oven for heating a food product comprises means for heating medium in the oven and programmed means for controlling as a first parameter the temperature of the heating medium. The system also includes programmed means for controlling as a second parameter the humidity of the heating medium and programmed means for controlling one or more time intervals for predetermined values of the temperature and humidity of the heating medium.

Also in accordance with the invention, a parameter control system for an oven for heating a food product comprises means for heating a heating medium in the oven and programmed means for controlling as a first parameter the temperature of the heating medium. The system also includes programmed means for controlling as a second parameter the circulation of the heating medium and programmed means for controlling one or more time intervals for predetermined values of the temperature and circulation of the heating medium.

Also in accordance with the invention, a parameter control system for an oven for heating a food product comprises means for heating a heating medium in the oven and means for controlling a first parameter of a heating medium. The system also includes means for controlling one or more time intervals for a predetermined value of the first parameter in which any of the time intervals is dependent on the measured value of the first parameter.

For a better understanding of the present invention together with other and further objects thereof, reference is made to the following description, taken in connection with accompanying drawings, and its scope will be pointed out in the appended claims.

Referring now to the drawings:

FIG. 1 is a schematic diagram representing a parameter control system in accordance with the invention;

FIGS. 2-5, inclusive, are flow charts comprising schematic representations of a portions of a microcomputer which operates according to computer programs produced according to the flow charts.

FIG. 6 is a graph representing a selected temperature difference vs. elapsed time characteristic of the cooking apparatus;

FIG. 7 is a flow chart comprising a schematic representation of a portion of a microcomputer which operates according to a computer program produced according to the flow chart.

FIG. 8 is a schematic diagram of an example of a closed-loop humidity control apparatus;

FIG. 9 is a schematic diagram of an example of closed loop volumetric flow control apparatus; and

FIG. 10 is a schematic diagram of another example of closed loop volumetric flow control apparatus.

Before referring to the drawings in detail, it will be understood that for purposes of clarity, the apparatus represented in block diagrams of FIGS. 2-5 and 7 utilize, for example, an analog-to-digital converter and a microprocessor which includes such hardware as a central processing unit, program and random access memories, timing and control circuitry, input-output interface devices and other digital subsystems necessary to the operation of a central processing unit as is well understood by those skilled in the art. The microprocessor operates according to the corresponding computer program produced according to the corresponding flow chart represented in the drawings.

Referring now more particularly to FIG. 1 of the drawings, a microcomputer 10 includes a central processing unit which receives an input from a keyboard 11 which may, for example, comprise a capacitive keyboard.

The apparatus includes a conventional power supply 12, a reset circuit 13 for resetting the microcomputer when renewing power in the power supply, a clock oscillator 14 for providing clock pulses to the mi-

crocomputer 10, a temperature sensor circuit 15 for sensing the temperature when in the cooking apparatus, an audible alarm 16, an alpha/numeric display 17 and indicator lights 18. The apparatus also includes an input status circuit 19 which may, for example, be responsive to a door switch (not shown) The microcomputer controls output relay circuits 20 which may, for example, control electric or other heating means 20 of the oven

Referring now more particularly to FIG. 2 of the drawings. When the start key 30 is actuated, the program parameter variables per product key, for example, time interval $t_1, t_2, \ldots t_n$, temperature $T_1, T_2, \ldots T_n$, humidity $H_1, H_2, \ldots H_n$, volumetric flow rate $V_1, V_2, \ldots V_n$ and flow circulation $R_1, R_2, \ldots R_n$, are determined. It will be understood that where t_n represents a time interval, T_n equals the temperature setting for the time interval t_n, H_n equals the humidity setting for the time interval t_n, V_n equals the volumetric flow rate for time interval t_n, R_n equals the direction of flow circulation (left or right) for the time interval t_n and n equals 1, 2, 3 . . . n to the number of intervals. When a first product key is pressed, a "product key pressed" microprocessor portion 32 is coupled to a "load all initial (n=1) variables for product key into setpoint registers" microprocessor portion 33.

The microprocessor portion 33 is coupled to an "enable temperature, humidity, volumetric and flow circulation algorithms" microprocessor portion 34.

The microprocessor portion 34 is coupled to a "prompt operator to select shelf or batch and change product key function from product to shelf or batch" microprocessor portion 35 The microprocessor portion 35 is coupled to an "are measured parameters in oven within acceptable band limits" microprocessor portion 36 The "no" output of the microprocessor portion 36 is coupled to the input of the microprocessor portion 34 The "yes" output of the microprocessor portion 36 is coupled to a "prompt operator that oven setpoints are met" microprocessor portion 37

The operator then presses a shelf key as represented by "shelf key pressed" microprocessor portion 38 in FIG 3 which is, for example, the second pressing of the originally pressed product key. A microprocessor portion "has shelf key been selected already?" has a "no" output coupled to the input of the microprocessor portion 38. The microprocessor portion 39 has a "yes" output coupled to a "display shelf identification" microprocessor portion 40. The output of the "display shelf identification" microprocessor portion 40 is coupled to a "start countdown timer n=1" microprocessor portion 41 which is coupled to an "is countdown timer finished" microprocessor portion 42 The "no" output of the microprocessor portion 42 is coupled to the input of the microprocessor portion 42 and the "yes" output of the microprocessor portion 42 is coupled to an "increment n" microprocessor portion 43.

The microprocessor portion 43 is coupled to a "load all parameters (t_n, T_n, H_n, V_n, R_n) into appropriate algorithm" microprocessor portions which are individually represented in FIG. 5 as "countdown timer" microprocessor portion 70 and in FIG. 4 as "temperature control algorithm" microprocessor portion 50, "humidity control algorithm" microprocessor portion 51, "volumetric control algorithm" microprocessor portion 52, and "flow of circulation control algorithm" microprocessor portion 53

The microprocessor portion 44 is coupled to an "enable all algorithms t_n, T_n, H_n, V_n, R_n" microprocessor portion 45 where t_n at this portion represents all timers after timer t_1.

The microprocessor portion 45 is coupled to a "has t_n countdown timer finished?" microprocessor portion 46 The "no" output of the microprocessor portion 46 is coupled to the input of the microprocessor portion 45 The "yes" output of the microprocessor portion 46 is coupled to an "has last countdown timer t_n finished countdown?" microprocessor portion 47 The "no" output of the microprocessor portion 47 is coupled to the input of the "8increment n" microprocessor portion 43. The "yes" output of the microprocessor portion 47 is coupled to a "prompt operator that cook cycle is complete" microprocessor portion 48

Referring now more particularly to FIG. 4 of the drawings, the temperature control algorithm, for example, may be a complex algorithm having different temperatures at different time intervals or may be a relatively simple control algorithm having a constant temperature over the heating or cooking period In the event that the temperature control algorithm can be represented by a constant temperature over a predetermined time interval for a first product upon depression of a first product key, and in the event that upon depression of a second product key a temperature control algorithm for a second product has the same temperature for a predetermined shorter time interval, then after the first key has been pressed twice and the product has been selected and the shelf has been selected, the second product key can be pressed twice to indicate the shelf for a second product to be heated or cooked during a portion of the same time interval as the first product.

An oven temperature sensor circuit 15 and a temperature setpoint register 55 are coupled to the input of the "temperature control algorithm" microprocessor portion 50 for effecting a heat control through a suitable heat control portion 56, which may, for example, be a closed loop electric heat control. The temperature control algorithm will be explained more fully subsequently

In a similar manner humidity monitor 57 and a humidity setpoint register 58 are coupled to a "humidity control algorithm" microprocessor portion 51 for effecting humidity control as represented by a suitable humidity control portion 59 This may be accomplished, for example, through a closed loop steam injection control

A flow rate monitor 60 and a flow rate setpoint register 61 are coupled to a "volumetric control algorithm" microprocessor portion 52 for effecting volumetric flow rate control as represented by portion 60 This may be accomplished, for example, by closed loop adjustment of a fan motor speed or closed loop adjustment of a duct aperture or closed loop adjustment of the axial position of a fan or a plurality of fans Also, the axial position of a fan may be empirically determined for control by a servomotor.

The closed loop adjustment of the fan motor speed may, for example, utilize a hot air duct and a flutter plate having an angular position determined by the volumetric flow and controlling the rotary position of a potentiometer which controls a variable-speed motor control for the fan

A flow circulation setpoint register 62 is coupled to a flow circulation control algorithm microprocessor portion 53 for effecting air circulation control represented by block 63 This may be effected by any technique

known to those skilled in the art, for example, by reversing the rotational direction of a constant-speed or variable-speed axial flow fan in order to change the pattern of air flow within the oven. This fan may be the same fan as utilized in the humidity control portion 59 and the volumetric flow rate control portion 60.

Referring now more particularly to FIG. 5 of the drawings, a typical "countdown timer" microprocessor portion 70 is represented. A "timer setpoint temperature" microprocessor portion 71 feds a setpoint temperature to the timer. An oven temperature sensor circuit 15 feeds the actual oven temperature to the timer. A "linear or parameter-dependent time" microprocessor portion 73 also applies an input to the timer. When the timer has counted down to zero, the microprocessor portion 70 actuates a "timer done" portion 74.

Referring now more particularly to FIG. 6 of the drawings there is represented a cooking curve, for example, for baking a suitable food product such as bread rolls. This cooking curve may be empirically determined for each cooking product. The empirical data is represented in a look-up table with 100 being equal to real time or no adjustment. With reference to FIG. 7, an "enter setpoint temperature and cooking time interval t_n" microprocessor portion 80 is coupled to a "cooking time interval t_n" register 81 and to a "setpoint temperature" register 82. The register 81 is coupled to a clock 87 to set the clock for countdown. The output of the "setpoint temperature" register 82 is coupled to a "cooking curve look-up table" microprocessor portion 83 which may contain the data represented by the graph of FIG. 6. The "oven temperature sensor circuit" 15 is also coupled to the microprocessor portion 83. A "cooking curve counter" microprocessor portion 85 is loaded with a value from the curve look-up table 83. The value in the look-up table is determined by measuring the difference between the actual oven temperature and the setpoint temperature (desired cooking temperature). If the actual temperature is below the setpoint temperature, the negative difference means a longer time then the real time interval t_n is required for cooking to reach the setpoint temperature. The microprocessor includes an interrupt timer 86 which trips 100 times per second, for example. The interrupt timer decrements the cooking curve counter 85, for example, 100 times per second and thus with the actual temperature equal to the setpoint temperature, the cooking curve counter will reach zero once every second. When the curve counter reaches zero it decrements one second off the clock 87 which is timing the product. Thus the cooking time is parameter-dependent, for example, temperature-dependent.

Referring to FIGS. 5 and 7, the "linear or parameter-dependent time" microprocessor portion 73 and the "countdown timer" microprocessor portion 70 preferably include, for example, the "cooking curve look-up table" microprocessor portion 83, the "cooking curve counter" microprocessor portion 85, the "interrupt timer" microprocessor portion 86, and the clock 87.

Referring now more particularly to FIG. 8 of the drawings, a motor 90 rotates an air-movement device 91 which could, for example, be a squirrel cage fan. Steam may, for example, be injected by a solenoid-controlled injector 92 under the control of solenoid 93 and moved by the fan 91. A humidity sensor 94 senses the humidity in the oven and applies a corresponding electrical signal to a comparator 95. A humidity setpoint register 96 applies an electrical signal representing the desired humidity to a digital-to-analog converter 97 for application to the comparator 95. A pulsing circuit 98 having a pulsed output duty cycle proportional to the voltage input which represents the difference between the output signal of the humidity sensor 94 and the output signal of the digital-to-analog converter 97 controls the operation of the solenoid 93 which controls a suitable valve in the steam injector 92.

Referring now more particularly to FIG. 9, a hot air duct 100 supplies inside air or outside air or a combination of both as hot air toward a flutter plate 101 which rotates a potentiometer 102 in accordance with the position of the flutter plate. The position of the flutter plate depends on the volumetric flow rate of hot air against the flutter plate directed by a fan 91. The output signal of the potentiometer 102 is applied to a comparator 103 and a volumetric flow rate setpoint register 104 applies a digital signal representing the desired flow rate to a digital-to-analog converter 1-5 which applies its output signal to the comparator 103. The output signal of the comparator 103 representing the difference between the signals from the potentiometer 102 and the converter 105 is applied to a D.C. motor 106 to control the amount and direction of rotation thereof. A lead screw 107 is coupled to the shaft of the D.C. motor 106 for positioning the baffle gate 108 to open or close the hot air duct 111 in accordance with the setpoint of volumetric flow rate setpoint register.

Referring now more particularly to FIG. 10, another volumetric flow rate control is represented. A hot air duct 114 supplies hot air toward or away from a flutter plate 118 depending on the direction of rotation of a squirrel cage fan 91 which is axially displaceable into and away from the hot air duct 114. The position of the flutter plate 118 depends on the volumetric flow rate of hot air against the flutter plate directed by the fan 91. The fan 91 can be withdrawn from the duct with the effect that as the fan is withdrawn less of the fan is in the hot air path and the volumetric flow rate becomes smaller. The fan shaft 112 is concentric with a motor shaft 113. A locking device, for example, a spline (not shown) allows the motor shaft 113 to turn the fan shaft 112 while allowing the fan to be withdrawn from the duct. The fan motor 106 preferably turns the fan at a constant speed. As the fan rotates, the fan may be withdrawn from or inserted into the duct by means of a slide lever 117 moved back and forth by an actuator motor 119 having a lead screw 120. The actuating motor 119 can rotate clockwise and counter-clockwise.

In a closed loop system, the volumetric flow positions a flutter plate 118 which rotates a potentiometer 102 to convert the angular position of the flutter plate into a voltage. The voltage is applied to a comparator 103. A digital volumetric flow rate parameter value is applied from a loaded volumetric flow rate setpoint register 104 to a digitial-to-analog converter 105 which is also coupled to the comparator 103. If the two input voltages to the comparator are not the same, the output of the comparator will be positive or negative as determined by the input voltages. The actuator motor 119 is driven by the output signal of the comparator 103 and moves counter-clockwise or clockwise, either to widthdraw the fan or insert the fan in the duct. The flutter plate in turn rises as the fan is inserted due to the greater volumetric flow or falls as the fan is withdrawn until the two input voltages to the comparator are equal. This occurs for only one position of the flutter plate for a given volumetric flow rate value from the setpoint register

104 and digital-analog converter 105 Thus the flow rate can be set to any programmed input loaded into the register 104.

Occasionally products that are being baked have a consistency which is sensitive to high velocity air flow, i.e., as the product rises, its form is not yet solid. A high velocity fan will blow the product, causing an asymmetric and unpleasing aesthetic appearance. One way of controlling the aesthetic appearance is by setting the volumetric flow rate at a sufficiently low value not to disturb the product. Two examples of the adjustment of the volumetric flow rate have been described in connection with FIGS. 9 and 10.

Another way to control the aesthetic appearance and prevent skewing of the form of the product is to alternate the hot air flow circulation. This can be done by alternately changing direction of rotation of the fan.

The heating system may also be structured to include programmed microprocessor portions such that upon at least one of a plurality of actuations of the first product selection key, the heating system selects at least one parameter, for example, temperature, for a batch of a given product and so that upon another actuation of the first product selection key indicates an oven location for the batch of the given product Thus, the product selection key may be actuated, for example, three times, and the first two actuations select the same temperature for two batches of a given product placed at different locations. Then, for example, the third actuation of the product selection key causes the heating system to indicate the oven locations for the batches of the given product.

While there have been described what are at present considered to be the preferred embodiments of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and it is, therefore, aimed to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. A parameter control system for controlling temperature and volumetric flow rate for an oven for heating a food product comprising:

means for heating a heating medium in the oven;

first digitally programmed means, having temperature sensing means and having product keys and, having a predetermined temperature control algorithm communicating with said temperature sensing means and having program parameter variables per product key programmable for temperature values $T_1, T_2, \ldots T_n$ at time intervals $t_1, t_2, \ldots t_n$, respectively, where n equals 1, 2 . . . n to the number of intervals, and said digitally programmed means including closed loop heat control means controlled by said algorithm, for controlling as a first parameter the temperature of the heating medium;

second digitally programmed means, having a predetermined volumetric control algorithm having program parameter variables per product key programmable for volumetric flow rate values $V_1, V_2 \ldots V_n$ at time intervals $t_1, t_2 \ldots t_n$, respectively, where n equals 1, 2 . . . n to the number of intervals, for controlling as a second parameter the volumetric flow rate of the heating medium; and

said first digitally programmed means including digitally programmed means for controlling a plurality of time intervals for predetermined values of the temperature and for predetermined values of the volumetric flow rate, per product key, of the heating medium in the oven

2. A system in accordance with claim 1 which includes programmed means for controlling as a third parameter the humidity of the heating medium and in which said means for controlling one or more time intervals includes programmed means for controlling one or more time intervals for a predetermined value of the humidity of the heating medium in the oven.

3. A system in accordance with claim 1 in which a product key selects the programmed values of each of said parameters at predetermined time intervals

4. A system in accordance with claim 2 in which a product key selects the programmed values of each of said parameters at predetermined time intervals.

5. A system in accordance with claim 3 in which any of said time intervals is dependent on the measured value of at least one of said parameters

6. A system in accordance with claim 4 in which any of said time intervals is dependent on the measured value of at least one of said parameters

7. A system in accordance with claim 3 in which said product key is ineffective to initiate a cooking cycle unless one or more of said parameters is within one or more predetermined tolerance bands around one or more given setpoints.

8 A system in accordance with claim 4 in which said product key is ineffective to initiate a cooking cycle unless one or more of said parameters is within one or more predetermined tolerance bands around one or more given setpoints

9 A system in accordance with claim 1 in which said means for controlling said volumetric flow rate comprises a fan and at least one of means for adjusting the rotary speed of said fan, means for adjusting the location of the fan and means for adjusting an aperture for the flow of the heating medium

10. A system in accordance with claim 2 in which said means for controlling said volumetric flow rate comprises a fan and at least one of means for adjusting the rotary speed of the fan and means for adjusting an aperture for the flow of the heating medium

11. A parameter control system for controlling temperature and humidity for an oven for heating a food product comprising:

means for heating a heating medium in the oven;

first digitally programmed means, having temperature sensing means and having product keys and, having a predetermined temperature control algorithm communicating with said temperature sensing means and having program parameter variables per product key programmable for temperature values $T_1, T_2, \ldots T_n$ at time intervals $t_1, t_2, \ldots t_n$, respectively, where n equals 1, 2 . . . n to the number of intervals, and said digitally programmed means including closed loop heat control means responsive to said algorithm, for controlling as a first parameter the temperature of the heating medium;

second digitally programmed means, having a predetermined humidity algorithm having program parameter variables per product key programmable for humidity values $H_1, H_2 \ldots H_n$ at time intervals $t_1, t_2 \ldots t_n$, respectively, where n equals 1, 2 . . . n to the number of intervals, including closed loop humidity control means and humidity monitoring

means, for controlling as a second parameter the humidity of the heating medium; and

said first digitally programmed means including digitally programmed means for controlling a plurality of time intervals for predetermined values of the temperature and predetermined values of the humidity, per product key, of the heating medium in the oven.

12. A parameter control system for controlling temperature and volumetric flow rate and humidity for an oven for heating a food product comprising:

means for heating a heating medium in the oven;

first digitally programmed means, having temperature sensing means and having product keys and, having a predetermined temperature control algorithm communicating with said temperature sensing means and having program parameter variables per product key programmable for temperature values $T_1, T_2, \ldots T_n$ at time intervals $t_1, t_2, \ldots t_n$, respectively, where n equals 1, 2 . . . n to the number of intervals, and said digitally programmed means including closed loop heat control means responsive to said algorithm, for controlling as a first parameter the temperature of the heating medium;

second digitally programmed means, having a predetermined volumetric control algorithm having program parameter variables per product key programmable for volumetric flow rate values $V_1, V_2 \ldots V_n$ at time intervals $t_1, t_2 \ldots t_n$, respectively, where n equals 1, 2 . . . n to the number of intervals, including closed loop volumetric flow rate control means and flow rate monitoring means, for controlling as a second parameter the volumetric flow rate of the heating medium;

third digitally programmed means, having a predetermined humidity control algorithm having program parameter variables per product key programmable for humidity values $H_1, H_2, \ldots H_n$ at time intervals t_1, t_2, t_n, respectively, where n equals 1, 2 . . . n to the number of intervals, including closed loop humidity control means and humidity monitoring means, for controlling as a third parameter the humidity of the heating medium;

said first digitally programmed means including digitally programmed means for controlling a plurality of time intervals for predetermined values of the temperature and predetermined values of the volumetric flow rate and predetermined values of the humidity, per product key, of the heating medium in the oven.

13. A system in accordance with claim 1 in which said second digitally programmed means includes closed loop volumetric flow rate control means and flow rate monitoring means.

* * * * *

EXHIBIT 2

REDACTED

EXHIBIT 3

REDACTED

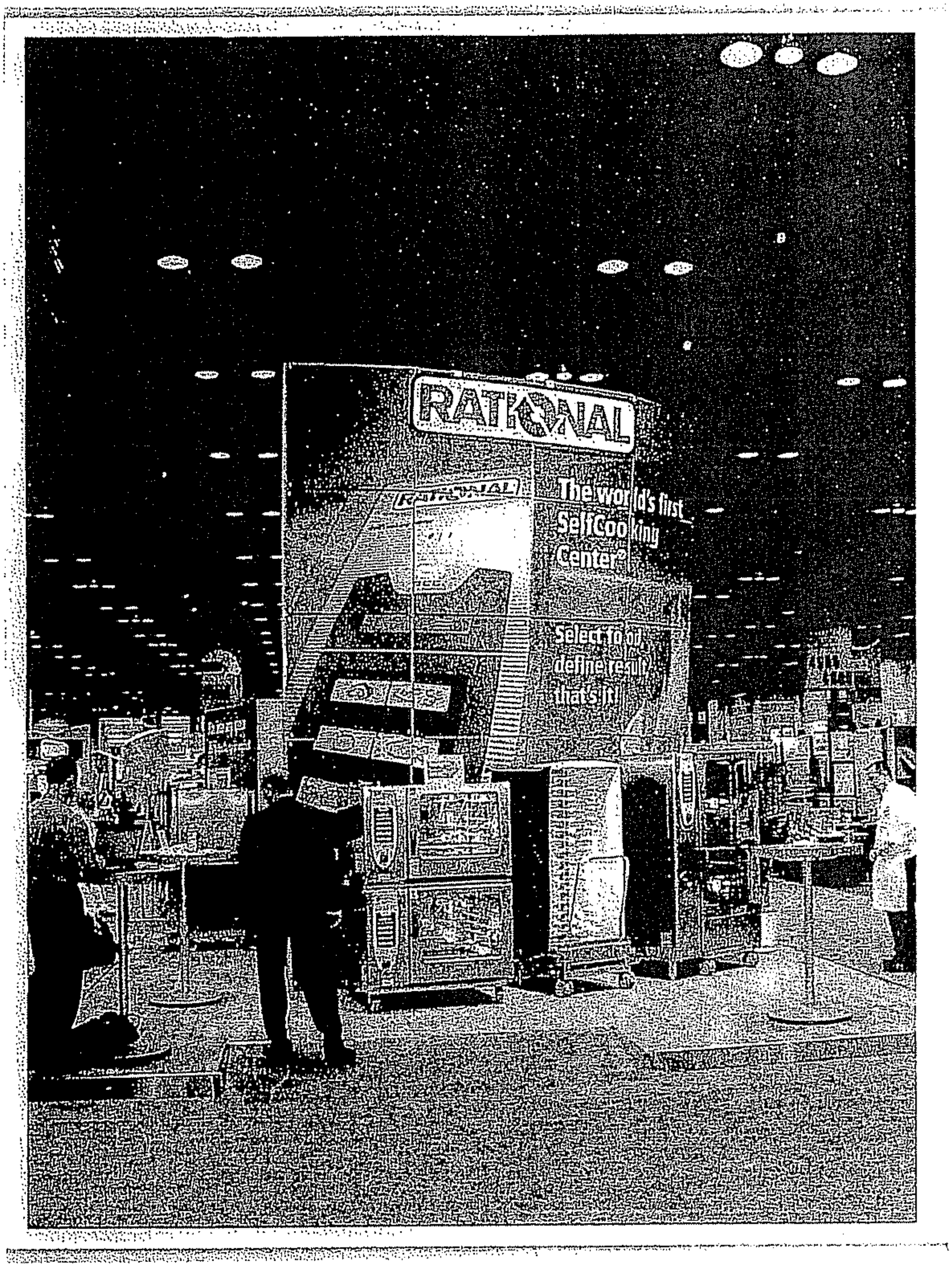
EXHIBIT 4

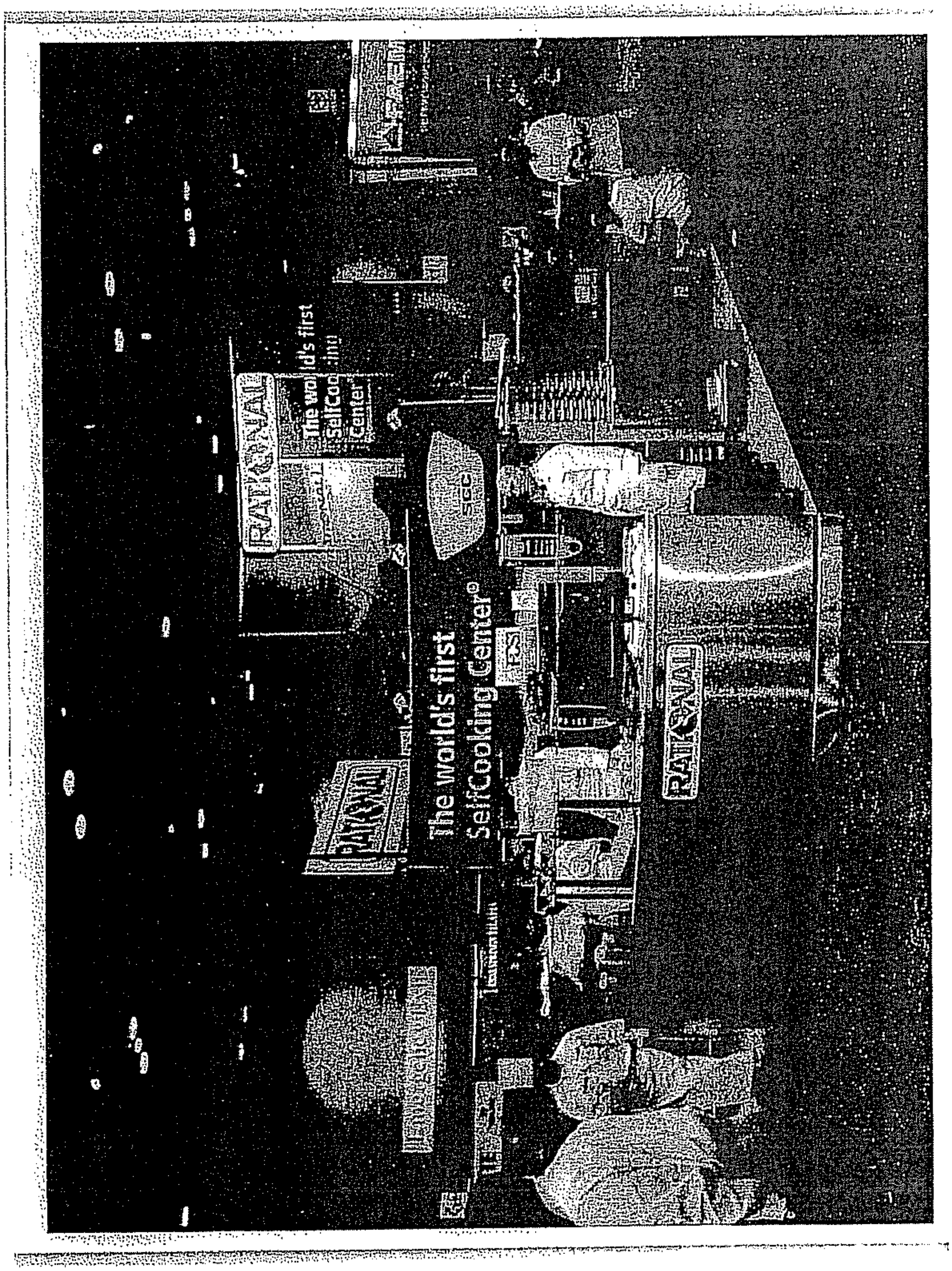
REDACTED

EXHIBIT 5

REDACTED

EXHIBIT 6


RATIONAL
The world's first
SelfCooking
Center®
Select food
define result
that's it!


RATIONAL
The world's first
SelfCooking Center®
RATIONAL

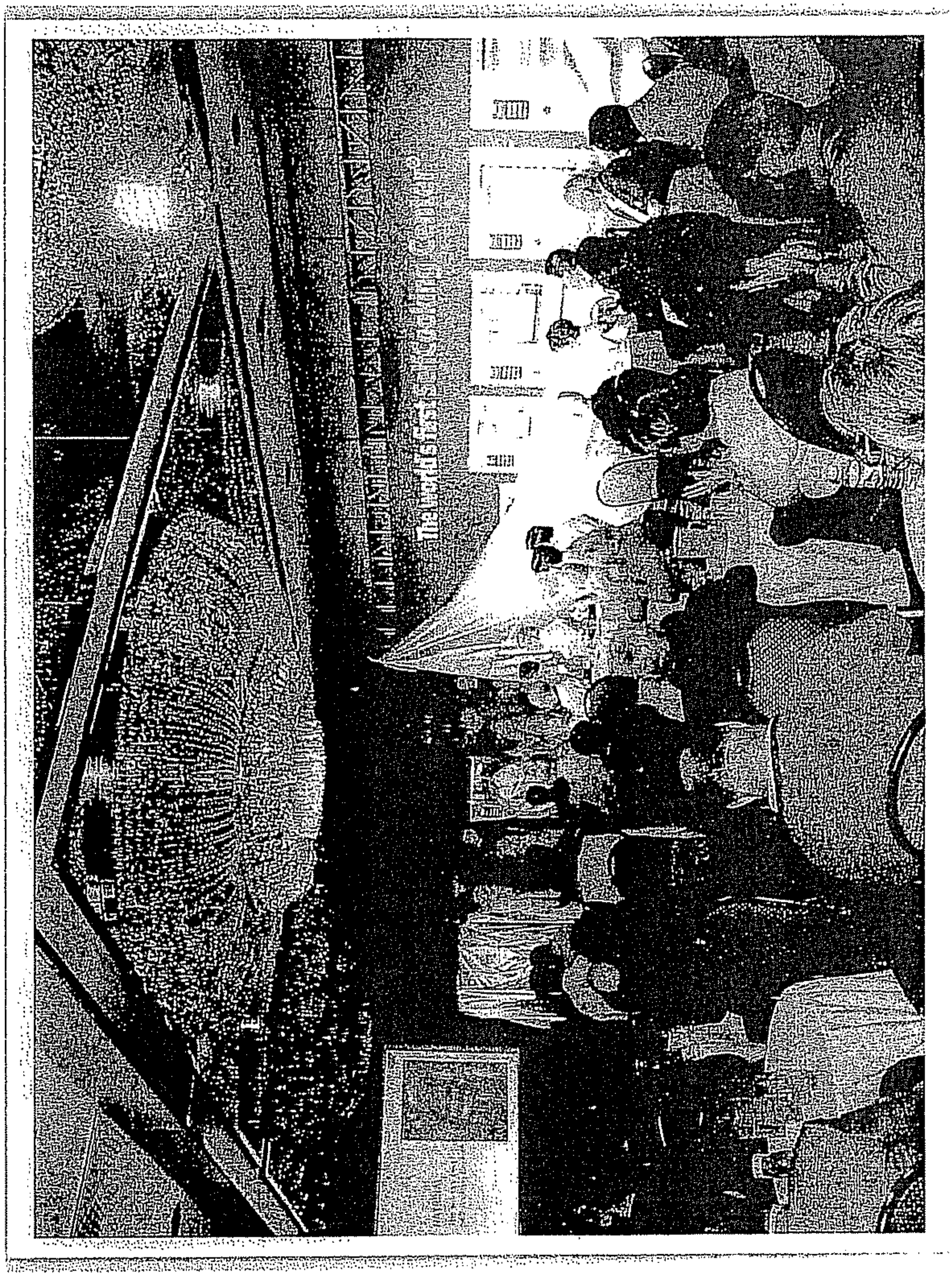


EXHIBIT 7

TECH TV

Where Possibilities and Solutions Meet

The newest and most innovative products from the 2004 National Restaurant Association Hotel-Motel Show

BY LISA SHAHEI

Just when you thought everything that can be done has been done, along comes the 85th National Restaurant Association Hotel-Motel Show. Here's a sampling: cooking equipment that takes care of everything at the push of a button, frozen sushi, wireless paging system for diners to contact their servers, color-changing food labels that indicate food expiration and triangle-shaped, mesh tea bags. From high-tech to low-tech, from low-carb to high-protein, the annual NRA Show held this past May at Chicago's McCormick Place provided foodservice professionals answers to a variety of restaurant-related problems.

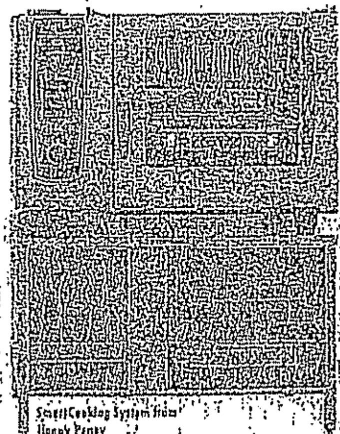
One of the most exciting pieces of equipment introduced at NRA comes from Rational, a German company with a North American location in Schaumburg, Ill. With its SelfCooking Center, chefs can bake, roast, steam, blanch, broil, finish and poach in a single unit, all by simply pressing a button. The SelfCooking Control automatically detects product-specific requirements, the size of the food to be cooked and the load size. Cooking time, temperature and the ideal oven climate are individually calculated and continuously adjusted.

Rational's SelfCooking Center

So what's left for chefs to do? Plenty, according to Rational. With this equipment chefs free themselves from the daily cooking routine—inputting traditional cooking data and constant monitoring—and have more time for the creative process—menu planning, mise en place, shopping and presentation.

According to Rational, the SelfCooking Center replaces up to 50 percent of all conventional cooking appliances, including convection ovens, stoves, tilt pans, boiling pans, steamers and deep-fryers. The unit is available in six different models and with both gas and electric capabilities.

Another European company making a big splash at NRA was Electrolux, which not only unveiled new products but also announced a stronger presence in the United States. With new offices in Miami, Fla., and Rocklin, Calif., and its Culinary Event Center, New Milford, Calif. (a result of a partnership with Nestle Food Services to pair food



SmartCooking System from Henny Penny

with its equipment), Electrolux Professional North America is "committed to the U.S. market," says Alberto Zanata, Electrolux's new president (previously vice president of marketing).

Last year, Electrolux turned heads at the show with its Cyber Fridge—a "talking" refrigerator that monitors food inventory and expiration dates. This year, the Electrolux Professional Pasta Station gathered crowds, partly due to its "Fastest Pasta Cooker" competition (winning culinary students received a two-week, all-expenses trip to Electrolux's culinary facility in Italy) and partly due to the equipment's innovative capabilities. Four automatic lowering/lifting baskets operate independently, allowing the chef to prepare four different kinds of pasta and sauces. Water temperature is automatically monitored to avoid overcooking. To round out the system, several equipment options are available, including worktops, electric ranges, bain marie, storage cupboards, mobile pasta freezer, blast chillers and ovens.

High-tech equipment could also be found from American manufacturers as well. Menomonee Falls, Wisc.-based Alto-Shaam introduced its HACCP networking software. Designed to interface with Alto-Shaam electronic cook/hold ovens and hot food holding cabinets, this new system provides both a simple and effective method of temperature recording. The HACCP documentation software automatically records the complete details of every cooking and holding process in complete compliance with HACCP requirements.

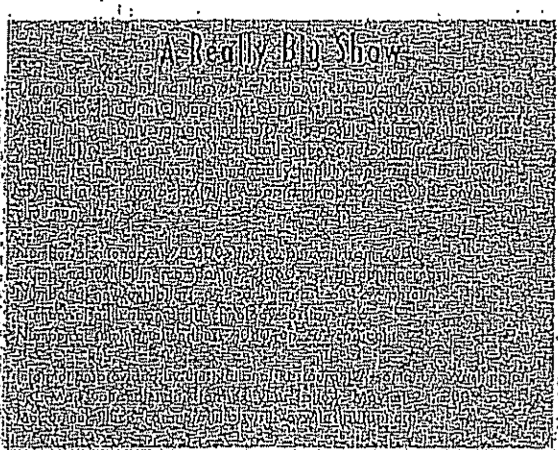
Smart Dot label system from DayMark

"The software automatically tracks all this information, eliminating human error, the time associated with recording and filing the data, and the need to organize sheets of paper," says Robert Shimnellak, corporate executive chef/business development manager of domestic sales division at Alto-Shaam. "This software also allows me to program all my ovens with cooking procedures, and all of this can be done anywhere in the world with only an Internet connection."

One-button/one-step cooking equipment can also be found at Henny Penny, Eaton, Ohio. Similar to Rational's SelfCooking units, the SmartCooking System from Henny Penny cooks items when the display depicting that food item is pressed. The operator doesn't need to enter cooking times, temperatures or humidity percentages or adjust the cooking cycle for large quantities. The equipment line includes six sizes, ranging from 6-pan to 40-pan capacity.

"This new smart technology answers most of the challenges and issues that operators have told us about," says Kathy Vedel, executive vice-president and chief marketing officer for Henny Penny. "It's all about taking the stress out of the kitchen and increasing operators' profitability."

Avero Inc., NYC, a provider of business intelligence software for the hospitality industry, recognizes that a restaurant's success not only depends on the quality of the food being served but on controlling daily operational costs as well. Its flagship software program, Slingshot, consolidates data from existing multiple POS sys-



At the NRA Show, Oliver Products Co. introduced the BreadMitt, a glove designed to provide a food-safe barrier between servers and bread and to prevent knife cuts.

"It's all about taking the stress out of the kitchen and increasing operators' profitability."
—Kathy Yeder, executive vp and chief marketing officer, Henny Penny

tems to generate straightforward, in-depth, easy-to-use, web-based business intelligence reports.

Already in use at a number of well-known restaurant groups, including Wolfgang Puck Fine Dining Group, Lettuce Entertain You Enterprises, The Patina Group and Union Square Hospitality Group, Slingshot provides managers with up-to-the-minute information to monitor costs and anticipate trends. A recent upgrade provides a suite of new sales and service performance analysis, including server sales reports.

"In every hospitality business, your servers are your sales force, and given their enormous impact on profitability, enhanced server management is a major focus of Slingshot 3.0," says Damian Mogavero, CEO of Avero.

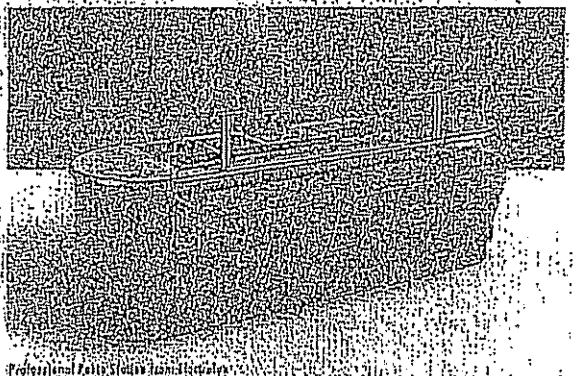
Food-safety innovation was another area that saw strong representation at the NRA show. Two companies unveiled food-labeling products incorporating TT Sensor technology developed by Avery Dennison. These labels illustrate a relationship between time and temperature using color as a freshness indicator.

The Sensor Label System from DayMark, Bowling Green, Ohio, uses a color-sensitive alarm clock on its label in which the face changes from yellow to pink to indicate expired food. Duration of color changes range from five days in a refrigerated cooler to as short as two hours at room temperature. This labeling technology enables operators to easily identify food products for proper food rotation and also reduces waste of salable products by eliminating premature disposal and identifying expired food.

Daydots, Forth Worth, Texas, incorporates similar technology in its Smart Dot label system. The Smart Dot base label is printed with special ink that changes color irreversibly over time. "The Smart Dot labels work well with almost any food product to provide another level of protection for customers," says Mike Milliorn, Daydot's founder and president. "For restaurant and foodservice operators, they will be especially useful in safeguarding high-value, temperature-sensitive foods."

Along with food safety, saving valuable kitchen space continues to be a top concern for restaurant operators. With that in mind, Garland, Freeland, Pa., a division of Enodis, downsized the traditional kitchen suite unit while keeping all the necessary equipment in place. "Chefs can work closer together now and be able to communicate easier," says Gerry Kinsella, manager of custom products.

Another piece of equipment from Garland that saves on space is its Half-Size Moisture+ Oven. Introduced at NRA, this multifunctional oven cooks, bakes and roasts with the benefits of moisture in a smaller footprint: 26-inches wide by 41-inches deep. Staff time is saved with its "set-and-forget" controls that provide fully automatic, temperature and moisture control. ■



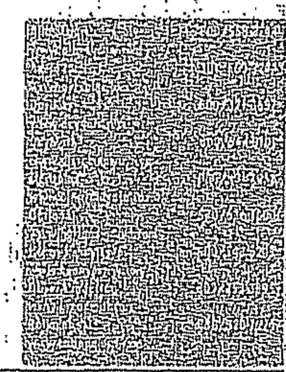


EXHIBIT 8

(FAST) The Time Is Right

Hot news

Back to Press Menu

Press Release

FAST Sues Rational Cooking Systems, Inc. for Patent Infringement

MEDIA CONTACT INFO

Stratford, Connecticut, August 22, 2006 -- Food Automation – Service Techniques, Inc. ("FAST"), a leader in the design and manufacture of appliance controls for the food industry, has filed suit in the United States District Court of Delaware charging Rational Cooking Systems, Inc ("Rational") a Delaware corporation with its principal place of business at 455 East State Parkway, Schaumberg, IL 60173 with patent infringement. Rational was established in 1993 as the United States subsidiary of Rational Aktiengesellschaft ("Rational AG"), a German corporation with headquarters in Landsberg a Lech, Germany In its complaint, FAST alleges that the sale of Rational ovens infringes U.S. Patent No. 4,920,948.

"We have invested significant time and resources in developing novel oven controls which are covered by this patent, as well as many other patented technologies, all of which provide great value for our customers. It is vital that we protect our customers and the advantages the technology brings them in the market, particularly in the case of this patent," said George Koether, President and CEO of FAST. "We will vigorously assert our patents against those who compete by willfully infringing our proprietary rights," added Chairman Ben Koether. "We have long prided ourselves on bringing to market compelling and unique technology solutions for our customers. We cannot stand by while others appropriate our customers' proprietary solutions for their own benefit."

In the complaint, FAST alleges that the infringement by Rational is willful and demands a jury trial and will request treble damages from the court. Besides seeking damages, FAST also seeks an injunction against future sales by Rational of the ovens containing the infringing features. FAST has been repeatedly successful in asserting this patent.

FAST is represented by the New York office of Morrison & Foerster. With more than a thousand lawyers in nineteen offices around the world, Morrison & Foerster offers clients comprehensive, global legal services in business and litigation. The firm is distinguished by its unsurpassed expertise in

finance, life sciences, and technology, legendary litigation skills, and an unrivaled reach across the Pacific Rim, particularly in Japan and China.

About Food Automation - Service Techniques, Inc. (FAST)
Based in Stratford, Connecticut, FAST is considered the World Leader in Foodservice Temperature and Process Control Solutions with products in over 65 countries. FAST introduced the first solid-state (FASTRON.)® cooking computer in 1970, and continues to lead the industry with products that improve food safety, food quality, and labor efficiency. FAST products are found in appliances and restaurants of major brands worldwide. (www.fastinc.com)

Certain information discussed above may constitute forward-looking statements within the meaning of the federal securities laws. Although the Company believes that the expectations reflected in any such forward-looking statements are based upon reasonable assumptions, it can give no assurance that its expectations will be achieved. Forward-looking information is subject to certain risks, trends and uncertainties that could cause actual results to differ materially from projected results. Among those risks, trends and uncertainties are the general economic climate, costs of food and labor, consumer demand, interest rate levels, the availability of financing and other risks associated with the acquisition, development and operation of new and existing restaurants.

###

For more info contact:

Rory Radding
Morrison & Foerster
(212) 468-8146 (phone)
RRadding@mofo.com

Steven Lupien
FAST
(203) 380-3412
SLupien@fastinc.com

BACK TO PRESS RELEASE MENU

BACK TO TOP